

PATENT
Serial No. 10/526,304
Amendment in Reply to Final Office Action mailed on July 17, 2006

IN THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Previously Presented) A scanning apparatus for scanning information in an information carrier comprising a plurality of layers for storing data on a material capable of generating an excited radiation when interacting with an exciting beam produced by an exciting source, said apparatus comprising:

an objective lens configured to project the exciting beam in a layer of the carrier and configured to collect the excited radiation, said objective lens having an objective lens numerical aperture;

a dichroic mirror arranged between the exciting source and the lens, and arranged to reflect the exciting beam towards the objective lens; and

a detector unit configured to detect the excited radiation

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collected on the objective lens, wherein the reflected exciting beam has a numerical aperture lower than the objective lens numerical aperture.

2. (Previously Presented) The scanning apparatus of claim 1, wherein the objective lens numerical aperture is between 0.5 and 1.

3. (Previously Presented) The scanning apparatus of claim 2, wherein the numerical aperture of the exciting beam is between 0.4 and 0.7.

4. (Previously Presented) The scanning apparatus of claim 1, further comprising an optical assembly arranged between the exciting source and the dichroic mirror, and configured to decrease the numerical aperture of the exciting beam.

5. (Previously Presented) The scanning apparatus of claim 1, wherein the dichroic mirror is configured to decrease the numerical aperture of the reflected exciting beam.

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6. (Previously Presented) The scanning apparatus of claim 4, wherein the optical assembly comprises an aperture configured to reduce a diameter of the exciting beam.

7. (Previously Presented) The scanning apparatus of claim 4, wherein the exciting source is a laser diode and the optical assembly comprises a collimator lens.

8. (Previously Presented) The scanning apparatus of claim 6, wherein the optical assembly further comprises a beam expander.

9. (Previously Presented) The scanning apparatus of Claim 1, wherein the exciting beam incident on the dichroic mirror has a numerical aperture lower than the objective lens numerical aperture.

10. (Previously Presented) The scanning apparatus of claim 9, further comprising an optical assembly arranged between the exciting source and the dichroic mirror, and configured to decrease the numerical aperture of the exciting beam.

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11. (Previously Presented) A scanning apparatus for scanning information in an information carrier comprising a plurality of layers for storing data on a material capable of generating an excited radiation when interacting with an exciting beam produced by an exciting source, said apparatus comprising:

an objective lens configured to project the exciting beam in a layer of the carrier and configured to collect the excited radiation, said objective lens having an objective lens numerical aperture;

a dichroic mirror arranged between the exciting source and the lens, and configured to transmit the exciting beam towards the objective lens; and

a detector unit configured to detect the excited radiation collected on the objective lens, wherein the transmitted exciting beam has a numerical aperture lower than the objective lens numerical aperture, and wherein the dichroic mirror is configured to transmit over an entire surface of the dichroic mirror, the excited radiation collected on the objective lens.

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12. (Previously Presented) The scanning apparatus of claim 11, further comprising an optical assembly arranged between the exciting source and the dichroic mirror, and configured to decrease the numerical aperture of the exciting beam.

13. (Previously Presented) The scanning apparatus of claim 12, wherein the optical assembly comprises an aperture configured to reduce a diameter of the exciting beam.

14. (Previously Presented) The scanning apparatus of claim 12, wherein the exciting source is a laser diode and the optical assembly comprises a collimator lens.

15. (Previously Presented) The scanning apparatus of claim 13, wherein the optical assembly further comprises a beam expander.

16. (Previously Presented) The scanning apparatus of Claim 11, wherein the exciting beam incident on the dichroic mirror has a numerical aperture lower than the objective lens numerical aperture.

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17. (Previously Presented) The scanning apparatus of Claim 11, wherein the exciting beam incident on the dichroic mirror is a diverging beam.

18. (Previously Presented) The scanning apparatus of Claim 11, wherein the dichroic mirror is configured to reflect over the entire surface of the dichroic mirror, the excited radiation collected on the objective lens.

19. (Previously Presented) The scanning apparatus of Claim 11, wherein the dichroic mirror is configured to reflect over an entire further surface of the dichroic mirror, the exciting beam towards the objective lens.